MultiModemUSB™

56K Data/Fax Modem with USB

Model MT5634ZBA-USB
Data/Fax Modem

User Guide

MultiTech® Systems

User Guide

Model MT5634ZBA-USB

PN 88310001 Revision B

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Record of Revisions

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A	8/1/98	Manual released.
B	3/3/00	Added software driver install procedure in Windows 2000 operating systems and new AT commands.

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Notice

Though these modems are capable of 56K bps download performance, line impairments, public telephone infrastructure and other external technological factors currently prevent maximum 56K bps connections.

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112 U.S.A
(763) 785-3500 or (800) 328-9717
US.. Fax (763) 785-9874
Technical Support (800) 972-2439
Internet Address http://www.multitech.com

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MultiModemUSB™

56K Data/Fax Modem with USB

Chapter 1 - Introduction and Description

MultiTech® Systems

Introduction

Welcome to the world of data communications. You have acquired one of the finest intelligent data and fax modems available today from one of America's oldest and most respected modem manufacturers: Multi-Tech Systems, Inc. This owner's manual will help you install, configure, test and use your modem.

Product Description

The MT5634ZBA-USB modem incorporates *V.90*™ technology, which enables Internet connections at data rates up to 53K bps* over standard telephone lines. V.90 technology is able to send data downstream from the Internet to your computer at these speeds because data on the telephone network typically is converted from digital to analog only once before it reaches your modem. Upstream transmissions, and transmissions between client modems, are limited to data rates of 33.6K bps, as are downstream transmissions that are converted more than once on the telephone network.

The MT5634ZBA-USB is Plug and Play-capable, with interactive automatic dialing and command mode configuration. In standard mode, you can store up to four command lines or telephone numbers of up to 40 characters each in the modems' nonvolatile memory. The modem pulse- or tone-dials, and recognizes dial tones and busy signals for reliable call-progress detection. The modem can detect AT&T calling card tones. It also has Caller ID, remote configuration and incorporates self-resetting lightning protection. The MT5634ZBA-USB is FCC-registered for connection without notification to the telephone company.

The MT5634ZBA-USB is a full-duplex intelligent modem with V.42 error correction, V.42bis data compression, and V.17 (14,400 bps), Class 1 and 2, Group 3 fax capabilities.

Universal Serial Bus (USB)

Universal Serial Bus (USB), defined by a consortium of industry leaders, permits connection of multiple low-speed and medium speed computer peripheral devices such as telephones, modems, printers, keyboards, mice, and scanners; all from a single personal computer port. The specification, based on an open architecture is quickly becoming a standard feature in new desktop and notebook computers.

* Although K56flex technology is capable of downloads of up to 56K bps, FCC regulations currently restrict ISP modems to downloads of 53K bps.

What Can You Do with Your Modem?

Your Multi-Tech MultiModem is the gateway to the exciting world of telecommunications.

You can use it to access commercial on-line information services such as CompuServe, America Online, Genie, and Prodigy. These services provide access to databases, encyclopedias, stock reports, news, weather, and shopping. They provide electronic mail (e-mail) links to subscribers of the same and other services. Public message areas called forums allow subscribers to trade information and opinions on a vast array of topics from A to Z, while vendor forums provide hardware and software support from Multi-Tech and other manufacturers. Online services also allow you to upload and download computer programs, data files, and updated software such as video and printer drivers.

Your modem can also connect you to the Internet, an international computer network of universities, libraries, businesses, and government agencies. Like the commercial online services, the Internet provides e-mail services, public message areas, and access to information and software, much of it easily accessed through the World Wide Web.

Other uses include direct links to colleagues with modems, to banks, and to service bureaus. You can also telecommute with your fax modem—work at home while communicating with the office by modem or fax.

And of course, you can use your modem to exchange faxes with any fax machine in the world, enabling you to communicate quickly with businesses and organizations that do not have direct modem communications.

Features

- Compliance with major ITU-T, TIA, and EIA international standards to ensure compatibility with other modems.
- Caller ID capability can identify a caller’s phone number (available only on U.S. products).
- Limited warranty: Ten years

Data

- Supports the V.90 standard for data transmission speeds up to 56K bps while maintaining compatibility with lower-speed modems.
- Supports the enhanced ITU-T V.34 standard, with data transmission speeds to 33.6K bps.
- Supports asynchronous data rates at 56K, 33.6K, 31.2K, 28.8K, 26.4K, 24K, 21.6K, 19.2K, 16.8K, 14.4K, 12K, 9600, 4800, 2400, 1200, and 300 bps.
- Supports automatic fallback to slower speeds in noisy line conditions, and fall-forward to faster speeds as conditions improve.
- ITU-T V.42 LAP-M and MNP Class 3 and 4 error correction.
- ITU-T V.42bis (4-to-1) and MNP 5 (2-to-1) data compression.
- Automatically disables data compression when transferring already-compressed files.
- Autodial, redial, pulse (rotary) and touch-tone dial.
- Dial tone and busy signal detection for reliable call-progress reporting.
- Compatible with the standard AT command set used by most communication programs.

Fax

- Supports V.17, Group 3 fax communication standards, allowing it to communicate with other fax modems as well as with fax machines.
- Responds to EIA/TIA Class 1 and 2 fax commands, enabling it to exchange editable and encrypted faxes with Windows 95 computers.
- Sends and receives faxes from your computer at 14,400 bps, 9600 bps, 7200 bps, 4800 bps, 2400 bps, or 300 bps.

Required Equipment

In addition to the contents of your modem package, you need the following equipment.

Computer

Your modem can only be connected to a computer with a USB port.

Telephone Line

You must have a telephone line with jack (connector) that accepts the cable that comes with the modem. If you do not have a telephone jack near your computer, you should install one before proceeding.

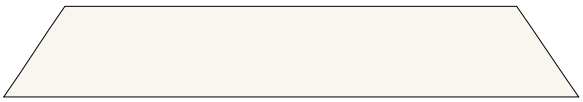
Do-it-yourself telephone extension kits and accessories are available wherever telephones are sold. You may also hire an independent contractor or your local telephone company to install an extension. If you want a separate line for your fax modem, you must contact your telephone company.

Communications Software

To operate your modem, you must have data communications and fax communications software (included with the modem). Data communications software simplifies control of the modem by guiding you through the process of selecting your serial port, your port speed, and other variables, and then storing your settings, including frequently called phone numbers, so they can be recalled with the stroke of a key or the click of a mouse. Data communications software must be set up, or configured, before you can use it.

Connections

To use your modem, you must connect it to your computer (“USB”), to a telephone line (“LINE”), and optionally to a telephone set (“PHONE”).



Transmit Data: The TD LED flashes when the modem is transmitting data to another modem.

Receive Data. The RD LED flashes when the modem is receiving data from another modem.

Carrier Detect. The CD LED lights when the modem detects a valid carrier signal from another modem. It is on when the modem is communicating with the other modem and off when broken.

Off-Hook. The OH LED lights when the modem is off-hook, which occurs when the modem dialing, online, or answering a call. The LED flashes when the modem pulse

Terminal Ready. The TR LED lights when Windows detects and initializ

Power. The PWR led lights when the system is applying power to the modem.

Technical Specifications

Your MultiModemZBA-USB fax modem meets the following specifications:

Trade Name	MultiModemUSB™
Model Number	MT5634ZBA-USB
Client-to-Server Data Rates	K56flex speeds when accessing an ISP type K56flex server (actual speed depends on server capabilities and line conditions) *
Client-to-Client Data Rates	33,600, 31,200, 28,800, 26,400, 24,000, 21,600, 19,200, 16,800, 14,400, 12,000, 9600, 7200, 4800, 2400, 1200, 0-300 bps
Fax Data Rates	14,400, 9600, 7200, 4800, 2400, 300 bps
Data Format	Serial, binary, asynchronous
Modem Compatibility	K56flex; ITU-T V.34 enhanced, V.34, V.32terbo, V.32bis, V.32, V.22bis, V.22; Bell 212A and 103/113; ITU-T V.29, V.42, V.42bis; ITU-T V.21 & V.23 in international versions
Fax Compatibility	ITU-T Group 3, Class 1 and 2, T.4, T.30, V.21, V.27ter, V.29, V.17, and TIA/EIA TR29.2
Error Correction	ITU-T V.42 (LAP-M or MNP 3–4)
Data Compression	ITU-T V.42bis (4:1 throughput), MNP 5 (2:1 throughput)
Flow Control	XON/XOFF (software), RTS/CTS (hardware)
Intelligent Features	Plug and play; fully AT command compatible; autodial, redial, repeat dial; pulse or tone dial; dial pauses; auto answer; caller ID; EIA extended automode; adaptive line probing; automatic symbol and carrier frequency during start-up, retrain, and rate renegotiation; DTMF detection; call status display, auto-parity and data rate selections; keyboard-controlled modem options; non-volatile memory; on-screen displays for modem option parameters; command lines of up to 40 characters each; help menus; remote configuration;
Command Buffer	40 characters
Data Modulation	FSK at 300 bps, PSK at 1200 bps, QAM at 2400, 4800, and 9600 bps (non-trellis), QAM with trellis-coded modulation (TCM) at 9600, 12,000, 14,400, 16,800, 19,200, 21,600, 24,000, 26,400, 28,800, 31,200, 33,600, and 56,000 bps
Fax Modulation	V.21 CH2 FSK at 300 bps (half duplex) V.27ter DPSK at 4800 and 2400 bps V.29 QAM at 9600 and 7200 bps V.17TCM at 14400, 12000, 9600, and 7200 bps
Carrier Frequencies ITU-T V.34	1600, 1646, 1680, 1800, 1829, 1867, 1920, 1959, 2000 Hz
Carrier Frequencies AT&T V.32 terbo/ ITU-T V.32bis/V.32	1800 Hz
Carrier Frequencies V.22bis/V.22 or Bell 212A Standard (2400 & 1200 bps)	Transmit originate: 1200 Hz Transmit answer: 2400 Hz Receive originate: 2400 Hz Receive answer: 1200 Hz
Carrier Frequencies ITU-T V.23 (1200 bps)	Transmit originate: 390 Hz mark, 450 Hz space Receive originate: 1300 Hz mark, 2100 Hz space

	Transmit answer: 1300 Hz mark 2100 Hz space Receive answer: 390 Hz mark 450 Hz space
Carrier Frequencies ITU-T V.21 (0–300 bps)	Transmit originate: 980 Hz mark 1180 Hz space Receive originate: 1650 Hz mark 1850 Hz space Transmit answer: 1650 Hz mark 1850 Hz space Receive answer: 980 Hz mark 1180 Hz space
Carrier Frequencies Bell 103/113 (0–300 bps)	Transmit originate: 1270 Hz mark 1070 Hz space Receive originate: 2225 Hz mark 2025 Hz space Transmit answer: 2225 Hz mark 2025 Hz space Receive answer: 1270 Hz mark 1070 Hz space
Fax Carrier Frequencies	V.21 Ch2 (half duplex): 1650 Hz mark, 1850 HZ space for transmit originate 1650 HZ mark, 1850 Hz space for transmit answer V.27ter: 1800 Hz originate/answer V.29 QAM: 1800 Hz originate/answer V.17 TCM: 1800 Hz originate/answer
Transmit Level	-11 dBm (dial-up)
Frequency Stability	±0.01%
Receiver Sensitivity	-43 dBm under worst-case conditions
AGC Dynamic Range	43 dB
Connectors	USB connector; two RJ-11 phone jacks
Cables	One 7-foot RJ-11 phone cable One 4-foot USB cable **Note:** Any cables connected to the computer should be shielded to reduce interference.
Diagnostics	Power-on self test, local analog loop, local digital loop, remote digital loop.
Indicators	LEDs for Transmit Data, Receive Data, Carrier Detect, Off Hook, Terminal Ready, Power
Environmental	Temperature range 0°–50°C (32°–120°F); humidity range 20–90% (non-condensing)
Dimensions	10.8 cm wide x 14.8 cm long x 2.9 cm high (4.25″ x 5.8″ x 1.15″)
Weight	224 g (8 oz)
Limited Warranty	10 years

MultiModemUSB™

56K Data/Fax Modem with USB

Chapter 2 - Installation

MultiTech® Systems

Unpacking

We know you are eager to get your Multi-Tech fax modem up and running, so we'll skip the features for now, and show you step-by-step how to set it up, check it out, and make your first calls.

What You Will Need

Before starting, please make sure you have everything you need:

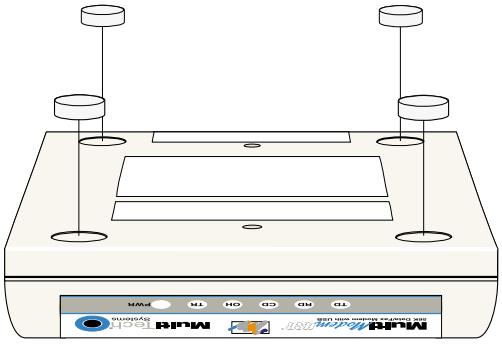
We supply

- An MT5634ZBA-USB data/fax modem
- One set of four plastic feet **Tf 103astic feetequipment.044 Tc -0.03 Tmake your fi369on dis.**
- Two sets of hook-and-loop fasteners
- One modular telephone cable
- One USB cable
- Trio communications software
- A *Quick Start Guide*
- This *User Guide* on disk
- An installation disk

You s6 Tc -0.02 Tw (One set of four p 4 0 TD 0.0nU (Mule)]sni)Tj /F1.8 putTf with-st unuse

Step 1: Assemble the Modem

The only assembly required is to mount the feet on the bottom of the modem. Simply peel the four self-adhesive plastic feet off the backing strip and press them into the recesses on the bottom of the modem. Alternately, or additionally, you can use the included self-adhesive hook-and-loop patches to mount the modem to a vertical surface or to keep it from being dislodged on a horizontal surface. If you use the hook-and-loop patches, we recommend that you mount them where they will not obscure the labels or screws on the bottom of the modem.



Step 2: Connect the Modem to Your System

Placing the modem in a convenient location, connect it to your computer's USB port, to the telephone line, and, optionally, to your telephone.

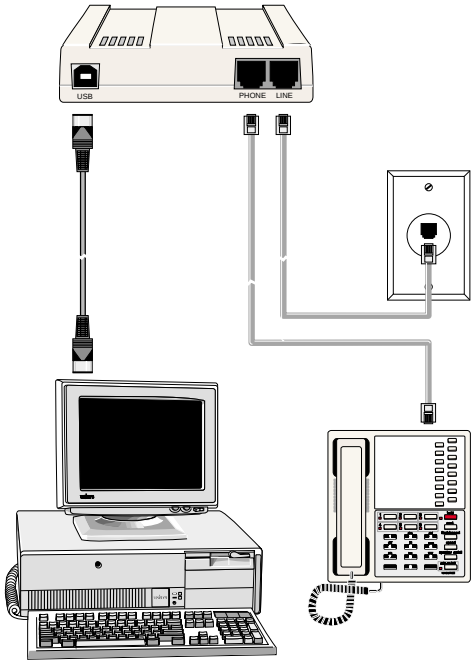


Figure 2-3. Modem connections.

USB Connection

Plug one end of the USB cable into the USB connector on the modem, and the other end into a USB port connector on your computer.

Line Connection

Plug one end of the phone cable into the modem's LINE jack, and the other end into a phone line wall jack.

Note: The LINE jack is not interchangeable with the PHONE jack. Do not plug the phone into the LINE jack or the line cable into the PHONE jack.

Note: The Federal Communications Commission (FCC), and Industry Canada impose certain restrictions on equipment connected to public telephone systems. See Appendix A for more information.

Phone Connection

For voice-only calls, you can optionally plug a telephone into the modem's PHONE jack.

Step 3: Install the Modem

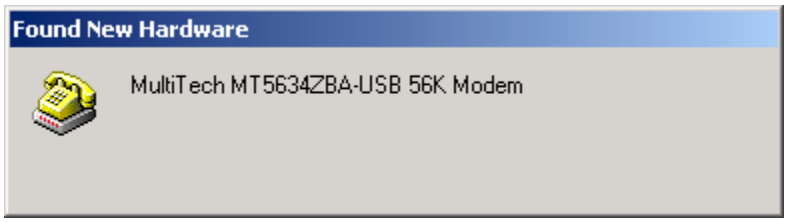
The MT5634ZBA-USB software drivers need to be installed in your computer's program directory. The procedure will be different depending on the operating system. This section provides installation procedures for Windows 2000, Windows 98, and Windows 95.

Installation in Windows 2000

1. Power up your Windows 2000 system.
2. If you have not already done so, connect one end of your USB cable to a USB connector on your PC, and connect the other end to the USB connector on your modem. The Power LED on your modem will light.
3. Windows 2000will detect that the new modem is present and install the software drivers. Two screens will appear during the installation process.

   Screen 1

   Screen 2



4. Once Screen 2 disappears, your MT5634ZBA-USB driver software installation is complete. You should test the operation of your new MT5634ZBA-USB by registering your MT5634ZBA-=USB product now. Key in the URL given below and follow the on-line instructions:

   http://www.multitech.com/register

Installation in Windows 98

1. Power up your Windows 98 system.
2. If you have not already done so, connect one end of your USB cable to a USB connector on your PC, and connect the other end to the USB connector on your modem. The Power LED on your modem will light.
3. Windows will detect that the new modem is present and launch the **Add New Hardware Wizard**.
4. Place the Installation diskette provided with your modem into your floppy drive and click **Next** to proceed with the installation.
5. Verify that the “Search for the best driver for your device. (Recommended)” option is selected and click **Next**.
6. Verify that the “Floppy disk drives” option is selected and click **Next**.
7. Windows will select the proper driver from the installation disk and will display the information for verification. Click **Next** to install the selected driver.
8. A message will appear when Windows finishes installing the driver. Click **Finish** to complete the installation and exit the wizard. The TR LED on your modem will light when the installation is complete.
9. Once installation is complete, you should test the operation of your new MT5634ZBA-USB by registering your MT5634ZBA-USB product now. Key in the URL given below and follow the on-line instructions:

   http://www.multitech.com/register

Installation in Windows 95

Only Certain versions of Windows 95 offer support for USB peripherals. If you are unsure if your Win95 system supports USB, a free USB evaluation utility is available from the Shopping Bag page at http://www.usb.org. Just download the utility (287K) and run the .exe application. It will determine if you have USB support.

If you would like to install your MT5634ZBA-USB in Windows 95, perform the following steps.

1. Insert the Setup disk provided with your modem into your floppy drive.
2. If you have not already done so, connect one end of your USB cable to a USB connector on your PC, and connect the other end to the USB connector on your modem. The Power LED on your modem will light.
3. Windows will detect that the new modem is present and launch the **Update Device Driver Wizard**. Click **Next** to proceed with the installation.
4. Windows searches for the driver on A:\ and, when identified, will display the driver name for verification. Click **Finish** to install the driver.
5. Windows prompts you to insert a diskette. You have already inserted the diskette, so click **OK** to continue. The **Copy Files ...** dialog is displayed. In the **Copy files from** field, choose **A:** from the drop-down list and click **OK**.
6. When the driver is installed, a completion message will appear, the TR LED on your modem will light, and the wizard will exit. At this time your installation is complete.
7. Once installation is complete, you should test the operation of your new MT5634ZBA-USB by registering your MT5634ZBA-USB product now. Key in the URL given below and follow the on-line instructions:

   http://www.multitech.com/register

Removing Your Old Modem from Windows

When your new modem replaces another modem, the old modem installation remains in Windows after you install the new modem, and the old modem is still selected in HyperTerminal and other Windows applications. Although you can change the application connection descriptions one at a time, it is easier to force Windows applications to use the new modem by removing the old modem from Windows.

From Windows 2000

1. Click **Start | Settings | Control Panel**.
2. Double-click the Phone and Modems icon and click on the Modems tab.
3. In the list box, select the old modem.
4. Click **Remove**, then click **Close**.
5. The next time you dial a HyperTerminal connection, it will select your new modem and ask you to confirm the selection.

From Windows 98/95

1. Click **Start | Settings | Control Panel**.
2. Double-click the Modems icon to open the **Modems Properties** sheet.
3. In the list box, select the old modem.
4. Click **Remove**, then click **Close**.
5. The next time you dial a HyperTerminal connection, it will select your new modem and ask you to confirm the selection.

References

The World Wide Web is an excellent source of information about modems in general and modem installation, configuration, and troubleshooting in particular. The following Web sites are good places to start:

- Costmo's Other Resources Page:
  http://modems.rosenet.net/or/
- Curt's High Speed Modem Page:
  http://elaine.teleport.com/~curt/modems.html
- Data Communications FAQ:
  http://www.best.com/~malch/comfaq.html
- Multi-Tech Systems, Inc.:
  http://www.multitech.com/

MultiModemUSB™

56K Data/Fax Modem with USB

Chapter 3 - AT Commands, S-Registers and Result Codes

MultiTech® Systems

AT Commands

AT commands are used to control the operation of your modem. They are so called because each command must be preceded by the characters *AT* to get the *AT*tention of the modem.

AT commands can be issued only when the modem is in command mode or online command mode. The modem is in *command mode* whenever it is not connected to another modem. The modem is in *data mode* whenever it is connected to another modem and ready to exchange data. *Online command mode* is a temporary state in which you can issue commands to the modem while connected to another modem. To put the modem into online command mode from data mode, you must issue an *escape sequence* (**+++**) followed immediately by the *AT* characters and the command, e.g., **+++ATH** to hang up the modem. To return to data mode from online command mode, you must issue the command **ATO**.

To send AT commands to the modem you must use a communications program, such as the HyperTerminal applet in Windows 98 and 95, or the communications program included with your modem. You can issue commands to the modem either directly, by typing them in the terminal window of the communications program, or indirectly, by configuring the operating system or communications program to send the commands automatically. Fortunately, communications programs make daily operation of modems effortless by hiding the commands from the user. Most users, therefore, need to use AT commands only when reconfiguring the modem, e.g., to turn autoanswer on or off.

The format for entering an AT command is **AT*Xn***, where *X* is the command and *n* is the specific value for the command, sometimes called the command *parameter*. The value is always a number. If the value is zero, you can omit it from the command; thus, **AT&W** is equivalent to **AT&W0**. Most commands have a *default* value, which is the value that is set at the factory. The default values are shown in the “AT Command Summary,” which begins on the next page.

You must press ENTER to send the command to the modem. Any time the modem receives a command, it sends a response known as a *result code*. The most common result codes are *OK*, *ERROR*, and the *CONNECT* messages that the modem sends to the computer when it is connecting to another modem. For a table of valid result codes, see “Result Codes” at the end of this chapter.

You can issue several commands in one line, in what is called a command *string*. The command string begins with **AT** and ends when you press ENTER. Spaces to separate the commands are optional; they are ignored by the command interpreter. The most familiar command string is the *initialization string*, which is used to configure the modem when it is turned on or reset, or when your communications software calls another modem.

AT Command Summary

Command: **AT** **Attention Code**
Values: n/a
Description: The attention code precedes all command lines except **A/**, **A:**, and escape sequences.

Command: **ENTER Key**
Values: n/a
Description: Press the ENTER (RETURN) key to execute most commands.

Command: **A** **Answer**
Values: n/a
Description: Answer call before final ring.

Command: **A/** **Repeat Last Command**
Values: n/a
Description: Repeat the last command string. Do not precede this command with **AT**. Do not press ENTER to execute.

Command: **B*n*** **Communication Standard Setting**
Values: *n* = 0–3, 15, 16
Default: 1 and 16
Description: B0 Select ITU-T V.22 mode when modem is at 1200 bps.
B1 Select Bell 212A when modem is at 1200 bps.
B2 Deselect V.23 reverse channel (same as ***B3***).
B3 Deselect V.23 reverse channel (same as ***B2***).
B15 Select V.21 when the modem is at 300 bps.
B16 Select Bell 103J when the modem is at 300 bps.

Command: **C*n*** **Carrier Control**
Values: *n* = 1
Default: 1
Description: C0 Transmit carrier always off. (Not supported.)
C1 Normal transmit carrier switching (included for backward compatibility with some software).

Command: **D*s*** **Dial**
Values: *s* = dial string (phone number and dial modifiers)
Default: none
Description: Dial telephone number *s*, where *s* may up to 40 characters long and include the 0–9, *, #, A, B, C, and D characters, and the **L**, **P**, **T**, **V**, **W**, **S**, comma (**,**), semicolon (**;**), **!**, @, **^** and **$** dial string modifiers.

Dial string modifiers:

L Redial last number. (Must be placed immediately after **ATD**.)
P Pulse-dial following numbers in command.
T Tone-dial following numbers in command (default).
V Switch to speakerphone mode and dial the following number. Use **ATH** command to hang up.
W Wait for a new dial tone before continuing to dial. (**X2**, **X4**, **X5**, **X6**, or **X7** must be selected.)
, Pause during dialing for time set in register S8.
; Return to command mode after dialing. (Place at end of dial string.)
! Hook flash. Causes the modem to go on-hook for one-half second, then off-hook again.

@ Wait for quiet answer. Causes modem to wait for a ringback, then 5 seconds of silence, before processing next part of command. If silence is not detected, the modem returns a NO ANSWER code.
^ Disable data calling tone transmission.
$ Detect AT&T call card "bong" tone. The character should follow the phone number and precede the user's call card number: **ATDT1028807637853500$123456789**

Command: **DS=*y*** **Dial Stored Telephone Number**
Values: *n* = 0–3
Default: none
Description: Dial a number previously stored in directory number *y* by the ***&Zy=x*** command.
Example: **ATDS=3**

Command: **E*n*** **Echo Command Mode Characters**
Values: *n* = 0 or 1
Default: 1
Description: E0 Do not echo keyboard input to the terminal.
E1 Do echo keyboard input to the terminal.

Command: **F*n*** **Echo Online Data Characters**
Values: *n* = 1
Default: 1
Description: F0 Enable online data character echo. (Not supported.)
F1 Disable online data character echo (included for backward compatibility with some software).

Command: **H*n*** **Hook Control**
Values: *n* = 0 or 1
Default: 0
Description: H0 Go on-hook (hang up).
H1 Go off-hook (make the phone line busy).

Command: **I*n*** **Information Request**
Values: *n* = 0–5, 9, 11
Default: None
Description: I0 Display default speed and controller firmware version.
I1 Calculate and display ROM checksum (e.g., *12AB*).
I2 Check ROM and verify the checksum, displaying *OK* or *ERROR*.
I3 Display default speed and controller firmware version.
I4 Display firmware version for data pump (e.g., *94*).
I5 Display the board ID: software version, hardware version, and country ID
I9 Display the country code (e.g., *NA Ver. 1*).
I11 Display diagnostic information for the last modem connection, such as DSP and firmware version, link type, line speed, serial speed, type of error correction/data compression, number of past retrains, etc.

Command: **L*n*** **Monitor Speaker Volume**
Values: *n* = 0, 1, 2, or 3
Default: 2
Description: L0 Select low volume.
L1 Select low volume.
L2 Select medium volume.
L3 Select high volume.

Command: **M*n*** **Monitor Speaker Mode**
Values: *n* = 0, 1, 2, or 3
Default: 1
Description: M0 Speaker always off.
M1 Speaker on until carrier signal detected.
M2 Speaker always on when modem is off-hook.
M3 Speaker on until carrier is detected, except while dialing.

Command: **N*n*** **Modulation Handshake**
Values: *n* = 0 or 1
Default: 1
Description: N0 Modem performs handshake only at communication standard specified by ***S37*** and the ***B*** command.
N1 Modem begins handshake at communication standard specified by ***S37*** and the ***B*** command. During handshake, fallback to a lower speed can occur.

Command: **O*n*** **Return Online to Data Mode**
Values: 0, 1, 3
Default: None
Description: O0 Exit online command mode and return to data mode (see **+++*AT*<*CR*>** escape sequence).
O1 Issue a retrain and return to online data mode.
O3 Issue a rate renegotiation and return to data mode.

Command: **P** **Pulse Dialing**
Values: P, T
Default: T
Description: Configures the modem for pulse (non-touch-tone) dialing. Dialed digits are pulsed until a ***T*** command or dial modifier is received.

Command: **Q*n*** **Result Codes Enable/Disable**
Values: *n* = 0 or 1
Default: 0
Description: Q0 Enable result codes.
Q1 Disable result codes.
Q2 Returns an *OK* for backward compatibility with some software.

Command: **S*r*=*n*** **Set Register Value**
Values: *r* = S-register number; *n* varies
Default: None
Description: Set value of register S*r* to value of *n*, where *n* is entered in decimal format. E.g., **S0=1**.

Command: **S*r*?** **Read Register Value**
Values: *r* = S-register number
Default: None
Description: Read value of register S*r* and display it in 3-digit decimal form. E.g., **S2?** gives the response *043*.

Command: **T** **Tone Dialing**
Values: P, T
Default: T
Description: Configures the modem for DTMF (touch-tone) dialing. Dialed digits are tone dialed until a ***P*** command or dial modifier is received.

Command: **V*n*** **Result Code Format**
Values: *n* = 0 or 1
Default: 1
Description: V0 Displays result codes as digits (terse response).
V1 Displays result codes as words (verbose response).

Command: **W*n*** **Result Code Options**
Values: *n* = 0, 1, or 2
Default: 2
Description: W0 CONNECT result code reports serial port speed, disables protocol result codes.
W1 CONNECT result code reports serial port speed, enables protocol result codes.
W2 CONNECT result code reports line speed, enables protocol result codes.

Command: **X*n*** **Result Code Selection**
Values: *n* = 0–7
Default: 4
Description: X0 Basic result codes (*e.g., CONNECT*); does not look for dial tone or busy signal.
X1 Extended result codes (*e.g., CONNECT 46000 V42bis*); does not look for dial tone or busy signal.
X2 Extended result codes with *NO DIALTONE*; does not look for busy signal.
X3 Extended result codes with *BUSY*; does not look for dial tone.
X4 Extended result codes with *NO DIALTONE* and *BUSY*.
X5 Extended result codes with *NO DIALTONE* and *BUSY*.
X6 Extended result codes with *NO DIALTONE* and *BUSY*.
X7 Basic result codes with *NO DIALTONE* and *BUSY*.

Command: **Y*n*** **Long Space Disconnect**
Values: *n* = 0
Default: 0
Description: Y0 Disable sending or responding to long space break signal on disconnect.
Y1 Enable sending or responding to long space break signal on disconnect. (Not supported.)

Command: **Z*n*** **Modem Reset**
Values: *n* = 0 or 1
Default: None
Description: Z0 Reset modem to profile saved by the last ***&W*** command.
Z1 Same as ***Z0***.

Command: **&B*n*** **V.32 Auto Retrain**
Values: *n* = 1
Default: 1
Description: &B0 Disable V.32 auto retrain. (Not supported.)
&B1 Enable V.32 auto retrain.

Command: **&C*n*** **Data Carrier Detect (DCD) Control**
Values: *n* = 0 or 1
Default: 1
Description: &C0 Forces the DCD circuit to be always high.
&C1 DCD goes high when the remote modem's carrier signal is detected, and goes low when the carrier signal is not detected.
&C2 DCD drops briefly following disconnect, then goes high again. Register S18 defines how long DCD signal remains low after disconnect.

Command: **&E*n*** **XON/XOFF Pacing Control**
Values: *n* = 12 or 13
Default: 12
Description: &E12 Disables XON/XOFF pacing.
&E13 Enables XON/XOFF pacing. (**&K4** must also be set)

Note: &E13 has no effect if hardware control (&K3) is selected.

Caution: Do not enable pacing unless you need it. Some applications may not work if pacing is enabled.

Command: **&D*n*** **Data Terminal Ready (DTR) Control**
Values: *n* = 0, 1, 2, or 3
Default: 2
Description: &D0 Modem ignores the true status of the DTR signal and responds as if it is always on.
&D1 If DTR drops while in online data mode, the modem enters command mode, issues an *OK*, and remains connected.
&D2 If DTR drops while in online data mode, the modem hangs up. If the signal is not present, the modem will not answer or dial.
&D3 If DTR drops, the modem hangs up and resets as if an **ATZ** command were issued.

Command: **&F*n*** **Load Factory Settings**
Values: *n* = 0
Default: None
Description: &F0 Load factory settings as active configuration.

Note: See also the ***Z*** command.

Command: **&G*n*** **V.22bis Guard Tone Control**
Values: *n* = 0, 1, or 2
Default: 0
Description: &G0 Disable guard tone.
&G1 Set guard tone to 550 Hz.
&G2 Set guard tone to 1800 Hz.

Note: The ***&G*** command is not used in North America.

Command: **&J*n*** **Auxiliary Relay Control**
Values: *n* = 0
Default: 0
Description: &J0 The auxiliary relay is never closed.
&J1 Not supported—responds *ERROR*.

Command: **&K*n*** **Flow Control Selection**
Values: *n* = 0, 3, or 4
Defaults: 3
Description: &K0 Disable flow control.
&K3 Enable CTS/RTS hardware flow control.
&K4 Enable XON/XOFF software flow control.

Command: **&M*n*** **Communications Mode**
Values: *n* = 0
Defaults: 0
Description: &M0 Asynchronous mode.
&M1 Not supported—responds *ERROR*.

Command: **&Q*n*** **Asynchronous Communications Mode**
Values: *n* = 0, 5, 6, 8, or 9
Default: 5
Description: &Q0 Asynchronous with data buffering. Same as ***\N0***.
&Q5 Error control with data buffering. Same as ***\N3***.
&Q6 Asynchronous with data buffering. Same as ***\N0***.
&Q8 MNP error control mode. If MNP error control is not established, the modem falls back according to the setting in ***S36***.
&Q9 V.42 or MNP error control mode. If neither error control is established, the modem falls back according to the setting in ***S36***.

Command: **&S*n*** **Data Set Ready (DSR) Control**
Values: *n* = 0 or 1
Default: 0
Description: &S0 Force DSR always high (on).
&S1 Let DSR go high only during a connection.

Command: **&T*n*** **V.54 Test Commands**
Values: *n* = 0, 1, 3 or 6
Default: None
Description: &T0 Abort. Stop any test in progress.
&T1 Local analog loopback test.
&T3 Local digital loopback test.
&T6 Remote digital loopback test.

Note: To stop a test, you must use the escape sequence (**+++AT**) before typing **AT&T0**.

Command: **&V** **Display Current Settings**
Values: n/a
Description: Displays the active modem settings, including the callback security settings if callback security is enabled. If the setup password has been entered, it also displays the callback security passwords.

Command: **&W*n*** **Store Current Configuration**
Values: *n* = 0
Default: None
Description: &W0 Stores current modem settings in nonvolatile memory and causes them to be loaded at power-on or after the **ATZ** command instead of the factory defaults. See the ***&F*** command.
&W1 Clears user default settings from nonvolatile memory and causes the factory defaults to be loaded at power-on or following the **ATZ** command.

Command: **&Y*n*** **Select Stored Configuration for Hard Reset**
Values: *n* = 0
Default: 0
Description: &Y0 Select stored configuration 0 on power-up. (For backward compatibility with some software.)
&Y1 Not supported—responds *ERROR*.

Command: **&Zy=*x*** **Store Dialing Command**
Values: *y* = 0–3 (callback security disabled) or 0–29 (callback security enabled)
x = Dialing command
Default: None
Description: Stores dialing command *x* in memory location *y*. Dial the stored number using the command **ATDS=y**. See the ***#CBSn*** command. For callback security options, see Chapter 6.

Command: **\A*n*** **Select Maximum MNP Block Size**
Values: *n* = 0, 1, 2, or 3
Default: 3
Description: \A0 64-character maximum.
\A1 128-character maximum.
\A2 192-character maximum.
\A3 256-character maximum.

Command: **\B*n*** **Transmit Break**
Values: *n* = 0–9 in 100 ms units
Default: 3
Description: In non-error-correction mode only, sends a break signal of the specified length to a remote modem. Works in conjunction with the ***K*** command.

Command: **\G*n*** **Modem Port Flow Control**
Values: *n* = 0
Default: 0
Description: \G0 Returns an *OK* for backward compatibility with some software.
\G1 Not supported—responds *ERROR*.

Command: **\J*n*** **Data Buffer Control**
Values: *n* = 0
Default: 0
Description: \J0 Enable data buffer—serial port speed is independent of connect speed.
\J1 Disable data buffer—serial port speed is forced to the line speed.

Command: **\K*n*** **Break Control**
Values: *n* = 0–5
Default: 5
Description: Controls the response of the modem to a break received from the computer, the remote modem, or the ***B*** command. The response is different for each of three different states.

Data mode. The modem receives the break from the computer:
\K0 Enter online command mode, no break sent to the remote modem.
\K1 Clear data buffers and send break to the remote modem.
\K2 Same as ***K0***.
\K3 Send break immediately to the remote modem .
\K4 Same as ***K0***.
\K5 Send break to the remote modem in sequence with the transmitted data.

Data mode. The modem receives the break from the remote modem:
\K0 Clear data buffers and send break to the computer.
\K1 Same as ***K0***.
\K2 Send break immediately to the computer.
\K3 Same as ***K2***.
\K4 Send break to the computer in sequence with the received data.
\K5 Same as ***K4***.

Online command mode. The modem receives a ***Bn*** command from the computer:
\K0 Clear data buffers and send break to the remote modem.
\K1 Same as ***K0***.
\K2 Send break immediately to the remote modem.
\K3 Same as ***K2***.
\K4 Send break to the remote modem in sequence with the transmitted data.
\K5 Same as ***K4***.

Command: **\N*n*** **Error Correction Mode Selection**
Values: *n* = 0–5, or 7
Default: 3
Description: \N0 Non-error correction mode with data buffering (buffer mode; same as ***&Q6***).
\N1 Direct mode.
\N2 MNP reliable mode. If the modem cannot make an MNP connection, it disconnects.
\N3 V.42/MNP auto-reliable mode. The modem attempts to connect in V.42 error correction mode, then MNP mode, and finally non-error-correction (buffer) mode - continued operation.
\N4 V.42 reliable mode. If the modem cannot make a V.42 connection, it disconnects.
\N5 V.42, MNP, or non-error correction (same as ***\W3***).
\N7 V.42, MNP, or non-error correction (same as ***\W3***).

Command: **\Q*n*** **Flow Control Selection**
Values: *n* = 0, 1, or 3
Default: 3
Description: \Q0 Disable flow control (same as ***&K0***).
\Q1 XON/XOFF software flow control (same as ***&K4***).
\Q2 CTS-only flow control. Not supported.
\Q3 RTS/CTS hardware flow control (same as ***&K3***).

Command: **\T*n*** **Inactivity Timer**
Values: *n* = 0, 1–255
Default: 0
Description: \Tn Sets the time (in minutes) after the last character is sent or received that the modem waits before disconnecting. A value of zero disables the timer. Applies only in buffer mode.

Note: You can also set the inactivity timer by changing the value of ***S30***.

Command: **\V*n*** **Protocol Result Code**
Values: *n* = 0, 1, or 2
Default: 1
Description: \V0 Disable the appending of the protocol result code to the DCE speed.
\V1 Enable the appending of the protocol result code to the DCE speed.
\V2 Same as ***\V1***.

Command: **\X*n*** **XON/XOFF Pass-Through**
Values: *n* = 0 or 1
Defaults: 0
Description: \X0 Modem responds to and discards XON/XOFF characters.
\X1 Modem responds to and passes XON/XOFF characters.

Command: **-C*n*** **Data Calling Tone**
Values: *n* = 0 or 1
Defaults: 0
Description: -C0 Disable V.25 data calling tone to deny remote data/fax/voice discrimination.
-C1 Enable V.25 data calling tone to allow remote data/fax/voice discrimination.

Command: **%A** **Adaptive Answer Result Code Enable**
Values: n = 0 or 1
Defaults: 0
Description: The *%A* command controls whether the *DATA* and *FAX* result codes will be sent by the modem. The modem must be in fax mode for this command to work. Also, the modem must be set to **+FAA=1** which enables the modem to distinguish between a fax and a data call. When these

commands are enabled, the modem sends *DATA* to the computer when it detects data tones and *FAX* when it detects fax tones. These strings are used by some servers to select the appropriate communication program.

%A0 Disables adaptive answer result codes.
%A1 Enables adaptive answer result codes.

Command: **%B** **View Numbers in Blacklist**
Values: n/a
Description: If blacklisting is in effect, **AT%B** displays the numbers for which the last call attempted in the previous two hours failed. In countries that do not require blacklisting, the *ERROR* result code appears.

Command: **%C*n*** **Data Compression Control**
Values: *n* = 0 or 1
Default: 1
Description: %C0 Disable V.42bis/MNP 5 data compression.
%C1 Enable V.42bis/MNP 5 data compression.

Command: **%DC*n*** **AT Command Control**
Values: *n* = 0 or 1
Default: 0
Description: %DC0 The modem responds to AT commands.
%DC1 The modem ignores AT commands.

Note: The modem will respond to **AT%DC** for 10 seconds after power-up.

Command: **%E*n*** **Fallback and Fall Forward Control**
Values: *n* = 0, 1, or 2
Default: 2
Description: %E0 Disable fallback and fall forward.
%E1 Enable fallback, disable fall forward.
%E2 Enable fallback and fall forward.

Command: **#S*x*** **Enter Setup Password**
Values: *x*= password (1–8 characters, case sensitive)
Default: MTSMODEM
Description: Enters the remote configuration setup password.

Command: **#S=*x*** **Store Setup Password**
Values: *x*= password (1–8 characters, case sensitive)
Default: MTSMODEM
Description: Stores a new remote configuration setup password.

Command: **+++AT<CR>** **Escape Sequence**
Values: n/a
Description: Puts the modem in command mode (and optionally issues a command) while remaining online. Type **+++AT** and up to ten command characters, then press ENTER. Used mostly to issue the hang-up command: **+++ATH<CR>**.

Command: **%%%AT<CR>** **Remote Configuration Escape Sequence**
Values: n/a
Description: Initiates remote configuration mode while online with remote modem. The remote configuration escape character (%) is defined in register ***S13***.

S-Registers

Certain modem values, or parameters, are stored in memory locations called S-registers. Use the **S** command to read or to alter the contents of S-registers (see previous section).

Register	Unit	Range	Default	Description
S0	1 ring	0, 1–255	1	Sets the number of rings until the modem answers. **ATS0=0** disables autoanswer completely.
S1	1 ring	0–255	0	Counts the rings that have occurred.
S2	decimal	0–127 128–255	43 (+)	Sets ASCII code for the escape sequence character. Values greater than 127 disable escape.
S3	decimal	0–127	13 (^M)	Sets the ASCII code for the carriage return character.
S4	decimal	0–127	10 (^J)	Sets the ASCII code for the line feed character.
S5	decimal	0–32 33–127	8 (^H)	Sets the ASCII code for the backspace character. Values greater than 32 disable backspace.
S6	seconds	2–65*	2*	Sets the time the modem waits after it goes off-hook before it begins to dial the telephone number.
S7	seconds	1–255*	50*	Sets the time the modem waits for a carrier signal before aborting a call. Also sets the wait for silence time for the @ dial modifier.
S8	seconds	0–65	2	Sets the length of a pause caused by a comma character in a dialing command.
S9	decimal	0, 1–127	37 (%)	Sets ASCII code for remote configuration escape character. **S9=0** disables remote configuration.
S10	100 ms	1–254	20	Sets how long a carrier signal must be lost before the modem disconnects.
S11	1 ms	50–150*	95*	Sets spacing and duration of dialing tones.
S18	1 ms	0–255	20	Sets duration of time from the time the carrier signal goes low and then goes high again as set up by the **&C2** command.
S28	decimal	0, 1–255	1	0 disables, 1–255 enables V.34 modulation.
S30	1 minute	0, 1–255	0	Sets the length of time that the modem waits before disconnecting when no data is sent or received. A value of zero disables the timer. See also the ***\T*** command.
S35	decimal	0–1	0	0 disables, 1 enables the V.25 data calling tone, which allows remote data/fax/voice discrimination.
S36	decimal	0–7	7	Specifies the action to take in the event of a negotiation failure when error control is selected. (See ***S48***.)

Register	Unit	Range	Default	Description
S37	decimal	0–19	0	Sets the maximum V.34 “upstream” speed at which the modem attempts to connect. 0 = maximum modem speed 1 = reserved 2 = 1200/75 bps 3 = 300 bps 4 = reserved 5 = 1200 bps 6 = 2400 bps 7 = 4800 bps 8 = 7200 bps 9 = 9600 bps 10 = 12000 bps 11 = 14400 bps 12 = 16800 bps 13 = 19200 bps 14 = 21600 bps 15 = 24000 bps 16 = 26400 bps 17 = 28800 bps 18 = 31200 bps 19 = 33600 bps
S38	decimal	0–14	1	Sets the maximum 56K “downstream” speed at which the modem attempts to connect. The default maximum speed is 56K bps. 0 = 56K disabled 1 = 56K enabled* 2 = 32000 bps 3 = 34000 bps 4 = 36000 bps 5 = 38000 bps 6 = 40000 bps 7 = 42000 bps 8 = 44000 bps 9 = 46000 bps 10 = 48000 bps 11 = 50000 bps 12 = 52000 bps 13 = 54000 bps 14 = 56000 bps * with automatic speed selection at maximum modem speed
S42	decimal	0–1	1	Enables/disables the 56K auto rate. When 56K auto is disabled, fallback to V.34 is also disabled. 0 = disable; 1 = enable.
S43	decimal	0–1	1	*For testing and debugging only.* Enables/disables V.32bis start-up auto mode operation. 0 = disable; 1 = enable.

Register	Unit	Range	Default	Description
S48	decimal	7 or 128	7	Enables (7) or disables (128) LAPM negotiation. The following table lists the ***S36*** and ***S48*** configuration settings for certain types of connections.
S89	seconds	0, 5–255	10	Sets the length of time in the off-line command mode before the modem goes into standby mode. A value of zero prevents standby mode; a value of 1–4 sets the value to 5.

	S48=7	S48=128
S36=0, 2	LAPM or hangup	Do not use
S36=1, 3	LAPM or async	Async
S36=4, 6	LAPM, MNP, or hangup	MNP or hangup
S36=5, 7	LAPM, MNP, or aysnc	MNP or async

Result Codes

In command mode your modem can send responses called *result codes* to your computer. Result codes are used by communications programs and can also appear on your monitor.

Terse	Verbose	Description
0	*OK*	Command executed
1	*CONNECT*	Modem connected to line
2	*RING*	Ring signal detected
3	*NO CARRIER*	Carrier signal lost or not detected
4	*ERROR*	Invalid command
*5 **	*CONNECT 1200*	Connected at 1200 bps
6	*NO DIALTONE*	No dial tone detected
7	*BUSY*	Busy signal detected
8	*NO ANSWER*	No answer at remote end
*10**	*CONNECT 2400*	Connected at 2400 bps
*11**	*CONNECT 4800*	Connected at 4800 bps
*12**	*CONNECT 9600*	Connected at 9600 bps
*13**	*CONNECT 14400*	Connected at 14400 bps
*14**	*CONNECT 19200*	Connected at 19200 bps
*24**	*CONNECT 7200*	Connected at 7200 bps
*25**	*CONNECT 12000*	Connected at 12000 bps
*26**	*CONNECT 16800*	Connected at 16800 bps
*40**	*CONNECT 300*	Connected at 300 bps
*55**	*CONNECT 21600*	Connected at 21600 bps
*56**	*CONNECT 24000*	Connected at 24000 bps
*57**	*CONNECT 26400*	Connected at 26400 bps
*58**	*CONNECT 28800*	Connected at 28800 bps
*59**	*CONNECT 31200*	Connected at 31200 bps
*60**	*CONNECT 33600*	Connected at 33600 bps
*70**	*CONNECT 32000*	Connected at 32000 bps, 56K rate
*71**	*CONNECT 34000*	Connected at 34000 bps, 56K rate
*72**	*CONNECT 36000*	Connected at 36000 bps, 56K rate
*73**	*CONNECT 38000*	Connected at 38000 bps, 56K rate
*74**	*CONNECT 40000*	Connected at 40000 bps, 56K rate
*75**	*CONNECT 42000*	Connected at 42000 bps, 56K rate
*76**	*CONNECT 44000*	Connected at 44000 bps, 56K rate
*77**	*CONNECT 46000*	Connected at 46000 bps, 56K rate
*78**	*CONNECT 48000*	Connected at 48000 bps, 56K rate
*79**	*CONNECT 50000*	Connected at 50000 bps, 56K rate
*80**	*CONNECT 52000*	Connected at 52000 bps, 56K rate
*81**	*CONNECT 54000*	Connected at 54000 bps, 56K rate
*82**	*CONNECT 56000*	Connected at 56000 bps, 56K rate
88	*DELAYED*	Delay is in effect for the dialed number
89	*BLACKLISTED*	Dialed number is blacklisted
90	*BLACKLIST FULL*	Blacklist is full

* *EC* is added to these result codes when the extended result codes configuration option is enabled. *EC* is replaced by one of the following codes, depending on the type of error control connection:

V42bis —V.42 error control (LAP-M) and V.42bis data compression
V42 —V.42 error control (LAP-M) only
MNP5 —MNP 4 error control and MNP 5 data compression
MNP4 —MNP 4 error control only
NoEC —No error control protocol).

MultiModemUSB™

56K Data/Fax Modem with USB

Chapter 4 - Remote Configuration

MultiTech® Systems

Introduction

Remote configuration is a network management tool that allows you to configure modems anywhere in your network from one location. With password-protected remote configuration, you can issue AT commands to a remote MT5634ZBA-USB modem for maintenance or troubleshooting as if you were on-site.

Basic Procedure

The following steps are valid regardless of whether the connection is established by the local or the remote Multi-Tech modem.

1. Establish a data connection with a remote MT5634ZBA-USB modem.
2. Send three remote configuration escape characters followed by **AT** and the setup password, and press ENTER. Example: **%%%ATMTSMODEM<CR>**. You have four tries to enter the correct password before being disconnected. If the password is correct, the remote modem responds with

   OK
3. You can now send AT commands to configure the remote modem.
4. When you have finished configuring the remote modem, save the new configuration by typing **AT&W0<CR>**, then type **ATO<CR>** to exit remote configuration. You can then break the connection in the normal way.

   CAUTION: If you hang up while you are in remote configuration mode, it may lock up the remote modem.

Setup

Multi-Tech modems are shipped with a default setup password (MTSMODEM). Because anyone who has an owner's manual knows the default setup password, for security you should change the password and possibly also the remote configuration escape character.

Changing the Setup Password

1. Open a data communications program such as HyperTerminal.
2. In the terminal window, type **AT#SMTSMODEM** (or **AT#Syyyyyy** if you have replaced the MTSMODEM password with yyyyyy) and press ENTER. The modem responds with **OK** if the setup password is correct, and **ERROR** if it is wrong.
3. To change the password, type **AT#S=yyyyyy**, where yyyyyy stands for the password, and press ENTER. The password can include any keyboard character, and must be one to eight characters long. The modem responds with **OK**.
4. The new password is saved automatically. You can now either enter more AT commands or exit the data communications program. The next time you remotely configure the modem you must use the new setup password.

   Note: You can only change the setup password locally; you cannot do it remotely. Also, passwords are case sensitive. The next time you enter the password, it must be in the same case as you set it up.

Changing the Remote Escape Character

To increase security, you can change a remote modem's remote configuration escape character. The remote configuration escape character is stored in register ***S9***. The factory default is 37, which is the ASCII code for the percent character (%). Setting ***S9*** to 0 (zero) disables remote configuration entirely—but if you do this remotely, you won't be able to change it back remotely!

1. Establish a remote configuration link with the remote modem as described in "Basic Procedure."
2. Type **ATS9=*n***, where *n* is the ASCII code for the new remote configuration escape character, then press ENTER.
3. Save the new value by typing **AT&W** and pressing ENTER.
4. Type **ATO<CR>** to exit remote configuration.

MultiModemUSB™

56K Data/Fax Modem with USB

Chapter 5 - Troubleshooting

MultiTech® Systems

Introduction

Your modem was thoroughly tested at the factory before it was shipped. If you are unable to make a successful connection, or if you experience data loss or garbled characters during your connection, it is possible that the modem is defective. However, it is more likely that the source of your problem lies elsewhere. The following symptoms are typical of problems you might encounter:

- None of the LEDs light when the modem is on.
- The modem does not respond to commands.
- The modem dials but is unable to make a connection.
- The modem disconnects while online.
- The modem cannot connect when answering.
- The modem doesn't work with Caller ID.
- Fax and data software can't run at the same time.

If you experience problems, please check the following possibilities before calling Technical Support (see Appendix D).

None of the Indicators Light

When you plug in the modem, the Power LED should come on. After the operating system detects and configures the modem, the TR LED should come on.

- If the Power LED does not come on, double check the cable connections.
- If the TR LED does not come on, check to see that the software from the installation disk has been installed (see Chapter 2, Step 3).

The Modem Does Not Respond to Commands

- Make sure you are issuing the modem commands from the data communications software, either manually in terminal mode or automatically by configuring the software. (You cannot send commands to the modem from the DOS prompt.)
- Make sure you are in terminal mode in your data communications program, then type **AT** and press ENTER. If you get an *OK* response, your connections are good and the problem likely is in the connection setup in your communications software.
- Try resetting your modem by unplugging the USB cable from the modem, and then plugging it back in.
- Try rebooting the computer.
- The modem might be defective. If you have another Multi-Tech modem, try swapping modems. If the problem goes away, the first modem is possibly defective. Call Tech Support for assistance (see Appendix D).

The Modem Dials But Cannot Connect

There can be several reasons the ZBA fails to make a connection. Possibilities include

- lack of a physical connection to the telephone line.
- a wrong dial tone.
- a busy signal.
- a wrong number.
- no modem at the other end.
- a faulty modem, computer, or software at the other end.
- incompatibility between modems.

You can narrow the list of possibilities by using extended result codes. Extended result codes are enabled by default. If they have been disabled, enter **ATV1X4** and press ENTER while in terminal mode, or include **V1X4** in the modem's initialization string. When you dial again, the modem will report the call's progress.

- If the modem reports *NO DIALTONE*, check that the modem's telephone line cable is connected to both the modem's LINE jack (not the PHONE jack) and the telephone wall jack. If the cable looks secure, try replacing it. If that doesn't work, the problem might be in your building's telephone installation. To test the building installation, plug a telephone into your modem's telephone wall jack and listen for a dial tone. If you hear a dial tone, your modem might be installed behind a company phone system (PBX) with an internal dial tone that sounds different from the normal dial tone. In that case, the modem might not recognize the dial tone and might treat it as an error. Check your PBX manual to see if you can change the internal dial tone; if you can't, change your modem's initialization string to replace **X4** with **X3**, which will cause the modem to ignore dial tones (note, however, that **X3** is not allowed in some countries, such as France and Spain).
- If the modem reports BUSY, the other number might be busy, in which case you should try again later, or it might indicate that you have failed to add a **9,** prefix to the phone number if you must dial *9* for an outside line.

  If you must dial *9* to get an outside line, the easiest way to dial it automatically is to include it in the modem's dial prefix, e.g., **ATDT9,**. Note the comma, which inserts a pause before the number is dialed. By inserting **9,** into the dial prefix, you do not have to include it in each directory entry.

  To change the dial prefix in Windows 98 HyperTerminal, select **Call** from the **Call** menu, click **Dialing Properties**, and type **9** in the local and long distance boxes in **How I dial from this location**.
- If the modem reports *NO ANSWER*, the other system has failed to go off-hook, or you might have dialed a wrong number. Check the number.
- If the modem reports *NO CARRIER*, the phone was answered at the other end, but no connection was made. You might have dialed a wrong number, and a person answered instead of a computer, or you might have dialed the correct number but the other computer or software was turned off or faulty. Check the number and try again, or try calling another system to make sure your modem is working. Also, try calling the number on your telephone. If you hear harsh sounds, then another modem is answering the call, and the modems might be having problems negotiating because of modem incompatibilities or line noise. Try connecting at a lower speed.

The Modem Disconnects While Online

- If you have Call Waiting on the same phone line as your modem, it can interrupt your connection when someone tries to call you. If you have Call Waiting, disable it before each call. In most telephone areas in North America, you can disable Call Waiting by preceding the telephone number with ***70** (check with your local telephone company).

  You can automatically disable Call Waiting by including the disabling code in the modem's dial prefix (e.g., **ATDT*70,**—note the comma, which inserts a pause before the number is dialed). To change the dial prefix in Windows 98 HyperTerminal, select **Call** from the **Call** menu, click **Dialing Properties**, check **This location has Call Waiting**, and select the correct code for your phone service.

- If you have extension phones on the same line as your modem, you or someone else can interrupt the connection by picking up another phone. If this is a frequent problem, disconnect the extension phones before using the modem, or install another phone line especially for the modem.
- Check for loose connections between the modem and the computer and the telephone jack.
- You might have had a poor connection because of line conditions or the problem might have originated on the other end of the line. Try again.
- If you were online with an online service, it might have hung up on you because of lack of activity on your part or because you exceeded your time limit for the day. Try again.

The Modem Cannot Connect When Answering

- Autoanswer might be disabled. Turn on autoanswer in your data communications program or send the command **ATS0=1** (**ATS0=2** if you have Caller ID service) to make sure your modem in terminal mode.

The Modem Doesn't Work with Caller ID

- Caller ID information is transmitted between the first and second rings, so if autoanswer is turned off (**S0=0**) or if the modem is set to answer after only one ring (**S0=1**), the modem will not receive Caller ID information. Check your initialization string, and if necessary change it to set the modem to answer after the second ring (**S0=2**).
- Make sure that you have Caller ID service from your telephone company.

Fax and Data Software Can't Run at the Same Time

Communications devices can be accessed by only one application at a time. In Windows 98, you can have data and fax communication applications open at the same time, but they cannot use the same modem at the same time.

MultiModemUSB™

56K Data/Fax Modem with USB

Appendixes

MultiTech® Systems

Appendix A: Regulatory Agency Compliance

Class B Statement

FCC Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encourgaed to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference that may cause undesired operation.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user’s authoriyt to operate the equipment.

Industry Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la classe B respecte toutes les exigences du Reglement sur le material brouilleur du Canada.

FCC Part 68 Telecom

1. This equipment complies with part 68 of the Federal Communications Commission Rules. On the outside surface of this equipment is a label that contains, among other information, the FCC registration number. This information must be provided to the telephone company.
2. As indicated below, the suitable jack (Universal Service Order Code connecting arrangement) for this equipment is shown. If applicable, the facility interface codes (FIC) and service order codes (SOC) are shown.
3. A FCC-compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.
4. The ringer equivalence number (REN) is used to determine the quabtity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the device not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the local telephone company.
5. If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
6. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.
7. If trouble is experienced with this equipment (the model of which is indicated below) please contact MultiTech Systems, Inc. at the address shown below for details of how to have repairs made. If the equipment is causing harm to the network, the telephone company may request you to remove the equipment from the network until the problem is resolved.
8. No repairs are to be made by you. Repairs are to be made only by MultiTech Systems or its licensees. Unauthorized repairs void registration and warranty.
9. This equipment should not be used on party lines or coin lines.
10. If so required, this equipment is hearing-aid compatible.

Manufacturer:	MultiTech Systems, Inc.
Trade Name:	MultiModemUSB
Model Number:	MT5634ZBA-USB
FCC Registration Number:	AU7USA-24713-M5-E
Ren:	0.3B
Modular Jack (USOC):	RJllC or RJ11W (single line)
Service Center in USA:	MultiTech Systems, Inc. 2205 Woodale Drive Mounds View, MN 55112 (763) 785-3500 Fax (763) 785-9874

FAX Branding Statement

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device, including fax machines, to send any message unless such message clearly contains the following information:

- Date and time the message is sent
- Identification of the business or other entity, or other individual sending the message
- Telephone number of the sending machine or such business, other entity, or individual

This information is to appear in a margin at the top or bottom of each transmitted page or on the first page of the transmission. (Adding this information in the margin is referred to as *fax branding*.)

Since any number of Fax software packages can be used with this product, the user must refer to the Fax software manual for setup details. Typically the Fax branding information must be entered via the configuration menu of the software.

Canadian Limitations Notice:

RINGER EQUIVALENCE NUMBER

NOTICE: The ringer equivalence number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface, The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the ringer equivalence numbers of all the devices does not exceed 5.

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Commission Decision "CTR21"

The equipment has been approved to [Commission Decision"CTR21"] for pan-European single terminal connection to the Public Switched Telephone Network (PSTN). However, due to differences between the individual PSTNs provided in different countries, the approval does not, of itself, give an unconditional assurance of successful operation on every PSTN network termination point.

In the event of problems, you should contact your equipment supplier in the first instance.

CE

EMC, Safety and Terminal Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility.

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits:

and

Council Directive 98/13/EEC of 12 March 1998 on the approximation of the laws of Member States concerning telecommunications and Satellite earth station equipment.

New Zealand Telecom Warning Notice

The grant of a Telepermit for any item of terminal equipment indicates only that Telecom has accepted that the item complies with minimum conditions for connection to its network. It indicates no endorsement of the product by Telecom, nor does it provide any sort of warranty. Above all, it provides no assurance that any item will work correctly in all respects with another item of Telepermitted equipment of a different make or model, nor does it imply that any product is compatible with all of Telecom's network services.

This device is equipped with pulse dialing, while the Telecom standard is DTMF tone dialing. There is no guarantee that Telecom lines will always continue to support pulse dialing.

Use of pulse dialing, when this equipment is connected to the same line as other equipment, may give rise to 'bell tinkle' or noise and may also cause a false answer condition. Should such problems occur, the user should NOT contact the Telecom Faults Service.

The preferred method of dialing is to use DTMF tones, as this is faster than pulse (decadic) dialing and is readily available on almost all New Zealand telephone exchanges.

Warning Notice: No '111' or other calls can be made from this device during a mains power failure.

This equipment may not provide for the effective hand-over of a call to another device connected to the same line.

Some parameters required for compliance with Telecom's Telepermit requirements are dependent on the equipment (PC) associated with this device. In order to operate within the limits for compliance with Telecom's Specifications, the associated equipment shall be set to ensure that calls are answered between 3 and 30 seconds of receipt of ringing.

International Modem Restrictions

Some dialing and answering defaults and restrictions may vary for international modems. Changing settings may cause a modem to become non-compliant with national telecom requirements in specific countries. Also note that some software packages may have features or lack restrictions that may cause the modem to become non-compliant.

Appendix B - V.90 Support

Introduction

V.90 is the ITU designation for what had formerly been called V.pcm. The ITU recommendation V.90 was determined at a meeting in Geneva ending February 6, 1998.

V.90 will replace K56flex and other proprietary solutions for PCM connections. Dual-mode client modem code will be important until all central-site digital modems are upgraded to V.90 and all interoperability problems have been resolved. Until that time, the Dual-mode client code will provide reliable connections in K56flex mode to the central-site modems currently deployed.

Your V.90 dual-mode (V.90/K56flex) modem now includes:

- New AT commands,
- New Result Codes in V.90 mode, and
- A-law/μ-law selection and various changes to the AT command documentation.

These new functions are explained in documents that are readily-available on the Multi-Tech web site in Portable Document Format (PDF) files at **http://www.multitech.com/support/manuals/IDCfiles/manuals.idc .** You can download the Acrobat Reader to view PDF files (you may want to bookmark **http://www.adobe.com/prodindex/acrobat/readstep.html** before following the “download” link). For files with a .ZIP extension, you can download PKUNZIP.EXE to extract the zipped files from the Multi-Tech FTP site at: **ftp://ftp.multitech.com/Utiltities/PKUNZIP.EXE**. Using your favorite Web browser, go to **http://www.multitech.com/support/V.90upgrades.htm** for additional information on ITU V.90 support and other Multi-Tech products.

V.90 Troubleshooting

1. Check if the modem firmware is the latest. If not, download the latest from *ftp://ftp.multitech.com*.
2. Try adding one or more comma (,) characters to the dialed number in the dialing string.
3. Try limiting the speed with the **S37** (sets the maximum upstream speed) and **S38** (sets the maximum “downstream speed) commands.
4. Perform basic modem/line troubleshooting (check the phone line for noise, try a different line, try another device on the same line, etc.

Appendix C: Loopback Tests

Introduction

Each time you turn on your modem, it performs an automatic self-test to ensure proper operation. Your modem also has three diagnostic tests: local analog loopback, remote digital loopback, and local digital loopback. These ITU-T V.54 loopback tests isolate telephone circuit and transmission problems.

In a loopback test, data from your computer loops through the circuits of your modem and/or a remote modem before it appears on your monitor. When the loop has been completed, the data on your PC's monitor should match the original data.

The local analog loopback test allows you to verify that the modem's transmitter and receiver circuits are functioning properly.

The local digital loopback allows you to verify that the local computer or terminal, the two modems, and the transmission line between them are functioning properly.

The remote digital loopback test allows you to verify that the remote computer or terminal, the remote modem, the serial ports, the telephone line, and the local modem are functioning properly.

Note: All loopback tests operate at all speeds except 300 bps.

Local Analog Loopback Test (V.54 Loop 3)

In this test, data from your computer or terminal is sent to your modem's transmitter, converted into analog form, looped back to the modem's receiver, converted into digital form, and then sent to your monitor for verification. No connection to the phone line is required.

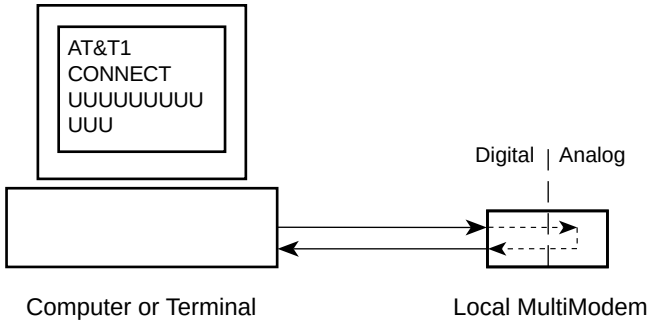


Figure C-1. Local analog loopback test.

Test Procedure

1. Connect the modem to your computer. Using your communication program, set the desired baud rate and go into terminal mode.
2. Type **AT&T1** and press ENTER. This places your modem in analog loopback mode in the originate mode. A *CONNECT* message should appear on your display. The modem is now out of command mode and in a pseudo-online mode.
3. Note that the CD LED is on. If you are set for 14,400 bps or higher, a speed LED should be on. If the CD LED is not on, there is a defect in your modem.
4. Enter characters from your keyboard. For this test, typing multiple uppercase *U* characters is a good way to send an alternating test pattern of binary ones and zeros. The characters entered should be displayed on your monitor. The TD and RD LEDs should flash when a character is entered.

5. To exit the test, type the escape sequence **+++AT** and press ENTER. This puts the modem in online command mode. Then type either **AT&T** or **ATH** to return to command mode.

6. Your modem passes this test if the data received on your monitor are the same as the data entered from your keyboard. If different data appear on your monitor, your modem is probably causing the problem, though it could also be your computer. If your modem passes this test, but you are receiving errors while on line, the remote modem or the phone line could be at fault.

Remote Digital Loopback Test (V.54 Loop 2)

The remote digital loopback test tests the phone lines and the circuits of both your modem and a remote modem. In this test, your modem must be on line with another modem that is set up to respond to a request for remote digital loopback. (Note that some modems might not support remote digital loopback or might have it disabled.) Data from your computer or terminal is transmitted through your modem and over the phone line to the remote modem, where it is then looped back to your modem.

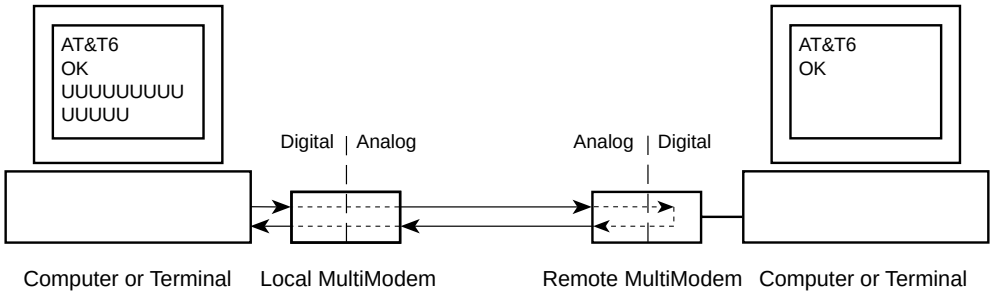


Figure C-2. Remote digital loopback test.

Test Procedure

1. Arrange to have **&T6** set on the remote test modem.

2. Open your communications software and go into terminal mode. Type **AT** and press ENTER; you should get an *OK* message. Type **AT\N** and press ENTER to disable error correction.

3. Dial the remote modem and establish your online connection.

4. Type the escape sequence **+++AT** and press ENTER to bring your modem into online command mode.

5. Type **AT&T6** and press ENTER. The local modem responds to this command by transmitting an unscrambled marking signal, which causes the remote modem to place itself in digital loopback mode. Then the local modem exits online command mode and enters data mode.

6. Enter data from your keyboard. For this test, typing multiple uppercase *U* characters is a good way to send an alternating test pattern of binary ones and zeroes. Data received by the remote modem enters its analog receiver, is converted to digital data, is reconverted into analog, and then is transmitted back to your modem. Your modem passes this test if the data received on your monitor is the same as the data entered from your keyboard.

7. To exit the test, type the escape sequence **+++AT** and press ENTER. This puts the modem in online command mode. The modem should respond with an *OK* message. If you wish to stay on line with the remote modem for normal data transmission, type **AT&T** and press ENTER to exit the test, then type **ATO** and press ENTER to return on line. If you wish to terminate the call, type **ATH** and press ENTER to hang up.

Local Digital Loopback Test (V.54 Loop 2)

The local digital loopback test is identical to the remote digital loopback test with one exception. Instead of using your modem to signal a remote modem to place itself in digital loopback mode, your modem is placed in digital loopback mode while the remote modem is not. Data is entered and transmitted from the remote modem, sent across the phone line to your modem, and looped back to the remote modem.

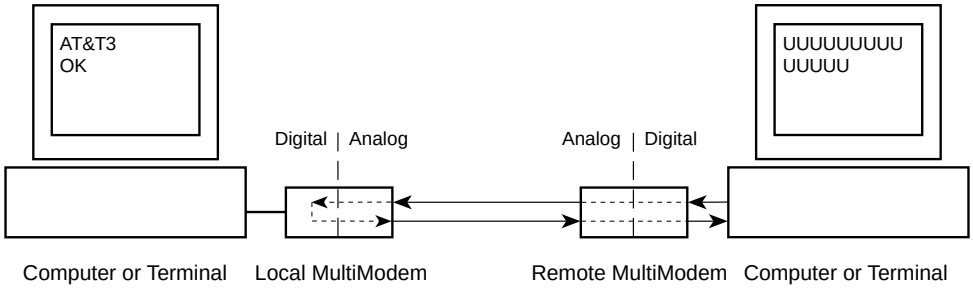


Figure C-3. Local digital loopback test

Test Procedure

1. Open your communications software and go into terminal mode. Type **AT** and press ENTER; you should get an *OK* message. Type **AT\N** and press ENTER to disable error correction.
2. Dial the remote modem and establish your online connection.
3. Type the escape sequence **+++AT** and press ENTER to bring your modem into online command mode.
4. Type **AT&T3** and press ENTER. Once you receive an *OK* message from your modem (if responses are enabled), your modem is placed in digital loopback mode.
5. Have someone enter data from the remote keyboard. For this test, typing multiple uppercase *U* characters is a good way to send an alternating test pattern of binary ones and zeros. The data received by your modem enters its analog receiver, is converted to digital data, is reconverted into analog, and then is transmitted back to the remote modem. Your modem passes this test if the data received on the remote monitor is the same as the data entered from the remote keyboard.
6. To exit the test, type the escape sequence **+++AT** and press ENTER. This puts the modem in online command mode. The modem should respond with an *OK* message. If you wish to stay on line with the remote modem for normal data transmission, type **AT&T** and press ENTER to exit the test, then type **ATO** and press ENTER to return on line. If you wish to terminate the call, type **ATH** and press ENTER to hang up.

Appendix D: Warranty, Service, and Technical Support

Limited Warranty

Multi-Tech Systems, Inc. (MTS) warrants that this product will be free from defects in material or workmanship for a period of ten years from the date of purchase or, if date of purchase is not provided, ten years from the date of shipment (limited to customers in the U.S., Canada, Mexico, and United Kingdom). For customers in all other countries, due to certain legal restrictions, MTS warrants that this product will be free from defects in material or workmanship for a period of five years from the date of purchase or, if date of purchase is not provided, five years from the date of shipment, unless otherwise limited or prohibited by law.

MTS MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

This warranty does not apply to any products that have been damaged by lightning storms, water, or power surges, or that have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by the customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products that prove to be defective within the warranty period, or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory with transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PURCHASE PRICE FOR DEFECTIVE PRODUCTS.

Online Warranty Registration

If you have access to the World Wide Web, you can register your Multi-Tech product online at the following URL:

http://www.multitech.com/register

Service

If you are outside the USA, your local distributor of Multi-Tech products usually offers the quickest and most economical repair option. If necessary, you may send your modem to our Mounds View factory in the USA. A modem that is shipped to us from outside the USA must have a Returned Materials Authorization (RMA) and shipping instructions. To return a modem for repair from inside the USA, no RMA is required; simply send it to us freight prepaid. Include a description of the problem, a return shipping address, and a check or purchase order for out-of-warranty repairs.

Please send modems that require repairs to the following address:

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112
Attn: Repair

If you are shipping from outside the USA, please contact our Repair Department for an RMA prior to your shipment. You can contact us by telephone at +(763) 785-3500 or by fax at +(763) 785-9874.

Technical Support

Multi-Tech Systems has an excellent staff of technical support personnel available to help you get the most out of your Multi-Tech product. If you have any questions about the operation of this unit, please call (800) 972-2439 (USA and Canada) or (763) 785-3500 (international and local). Please have modem information available.

About the Internet

Multi-Tech's presence includes a Web site at:

http://www.multitech.com
and an ftp site at:
ftp://ftp.multitech.com

Dial-Up Networking

Microsoft's Dial-Up Networking (DUN) is a system component of Windows 95, 98, and 2000 that enables you to connect your computer to a variety of computer systems and networks, including the Internet.

Dial-Up Networking has been integrated into Windows 2000. If you are using Windows 95, 98, you may need to install the Dial-Up Networking code from the full-release Windows CD, a companion CD from your Original Equipment Manufacturer (OEM), or from a complete set of installation (*.CAB) files on your hard drive. If you are connecting to the Internet, the TCP/IP protocol suite must also be installed on your computer.

If you are making a Dial-Up connection to the Internet, you'll need to set up an account with an Internet Service Provider (ISP). Your ISP should give you the following information:

- Your access account userid and password
- The access phone number(s) for dialing into your Internet Service Provider
- The protocol used to connect to your ISP (PPP or SLIP)
- Your ISP may or may not provide a *static* IP address for your computer. If your ISP provides an IP address for your computer or for their Domain Name Server (DNS), you'll need to enter these addresses when you configure the Dial-Up connection. Many ISPs use *dynamic* IP addresses which means they issue your computer a new IP address each time you log into their system. If your ISP uses dynamic IP addresses, you do not need to configure an IP address when you create your Dial-Up Connection.

The following instructions will guide you through setting up a basic Dial-Up Networking connection to the Internet. Many features and settings beyond those shown here are available for use when creating a Dial-Up connection.

Windows 98/95 Dial-Up Networking

Note: Before beginning, make certain Dial-Up Networking and TCP/IP are installed on your computer.

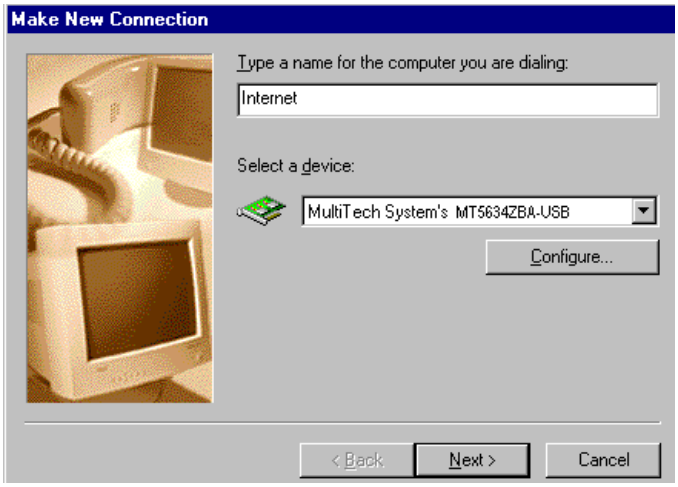
1. To begin your set up:

   a. In Windows 95, Click **Start | Programs | Accessories | Dial-Up Networking**.

   b. In Windows 98, Click **Start | Programs | Accessories | Communications | Dial-Up Networking**.

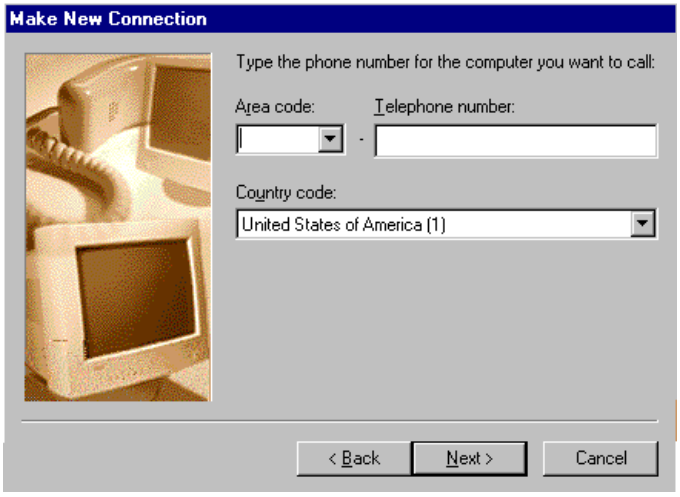
2. If this is the first time you have set up a connection with Dial-Up Networking, the **Welcome to Dial-Up Networking Wizard** dialog box is displayed. If the Wizard does not display, double-click the **Make New Connection** icon to display the **Make New Connection** dialog box.

3. The **Make New Connection** dialog box is displayed. Enter a descriptive name for this connection. In the **Select a device:** list box, select your **Multi-Tech System** modem from the list.



   Click **Next>**.

4. The **Make New Connection** dialog box is displayed. Enter the Area code, Telephone number and Country code for the computer you will be calling with this connection (your ISP's access phone number).



Click **Next>**.

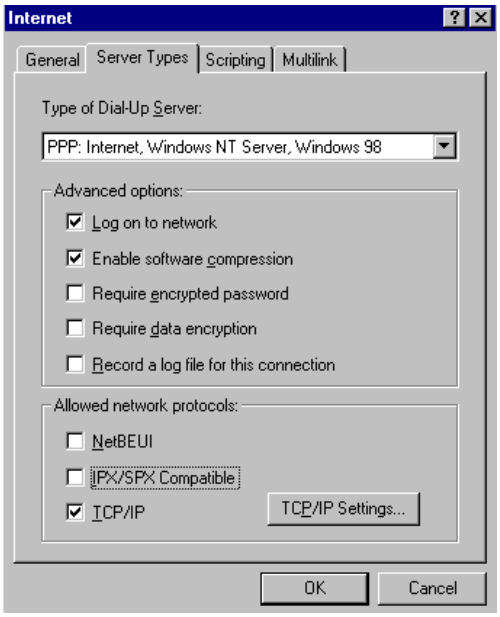
5. The **Make New Connection** dialog box is displayed indicating you have successfully created a new Dial-Up connection.

Make New Connection
You have successfully created a new Dial-Up Networking connection called:
Internet
Click Finish to save it in your Dial-Up Networking folder. Double-click it to connect.
To edit this connection later, click it, click the File menu and then click Properties.
< Back
Finish
Cancel

Click **Finish**.

6. From the Dial-Up Networking folder, right click on the Dial-Up Connection just created and select **Properties** to open the **Modem Properties** dialog box.

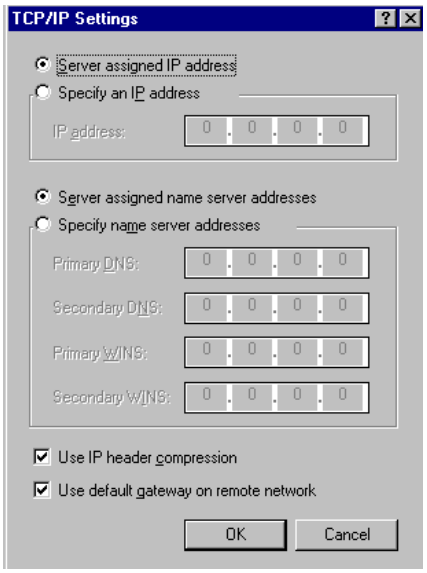
7. The **Modem Properties** dialog box is displayed. Click the **Server Types** tab to display the server property sheet. Select the appropriate Server Type, Log on options, and protocol selections for the device to which you are connecting (e.g., your ISP).



Click **OK**.

8. If your ISP requires you to enter IP addresses for their server or DNS (Domain Name Server), click the **TCP/IP Settings** button.

9. The **TCP/IP Settings** dialog box is displayed.



If your ISP provided you with an IP address for your computer, select **Specify an IP address** and enter the static address in the box provided. If your ISP requires you to enter an IP address for their name server (DNS), select **Specify name server addresses** and enter the IP addresses given to you by your ISP. Click **OK** to save the TCP/IP values and return to the **Server Types** tab.

When you have completed customizing the modem properties for this connection, click **OK**.

To use this connection, double-click the Dial-Up Connection icon within the Dial-Up Networking folder. If prompted, enter your Internet account User Name and Password and click **Connect**.

Windows 2000 Dial-Up Networking

The following instructions describe all Dial-Up Networking connection options under Windows 2000 as well as guide you through setting up a Dial-up Networking connection to an Internet Service Provider (ISP).

Note: If you are connecting to the Internet, make sure TCP/IP is installed on your computer and that you've set up an access account with an Internet Service Provider.

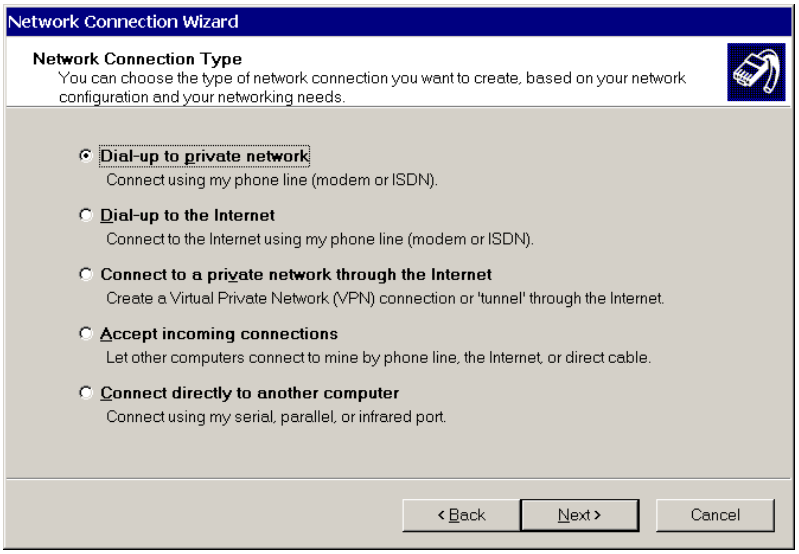
1. To set up a Dial-Up Networking connection within Windows 2000, select **Start | Settings | Network and Dial-up Connections**.

2. In the **Network and Dial-up Connections** dialog box, double-click the **Make New Connection** icon. The **Network Connection Wizard** dialog box is displayed indicating the Wizard will help in creating a connection to other computers and networks enabling applications such as e-mail, web browsing, file sharing and printing.

Network Connection Wizard
Welcome to the Network Connection Wizard
Using this wizard you can create a connection to other computers and networks, enabling applications such as e-mail, Web browsing, file sharing, and printing.
To continue, click Next.
< Back
Next >
Cancel

Click **Next>**.

3. The **Network Connection Type** dialog box is displayed offering several connection options. Select the option which best describes the type of connection you are creating with this definition.


Network Connection Wizard
Network Connection Type
You can choose the type of network connection you want to create, based on your network configuration and your networking needs.
Dial-up to private network
Connect using my phone line (modem or ISDN).
Dial-up to the Internet
Connect to the Internet using my phone line (modem or ISDN).
Connect to a private network through the Internet
Create a Virtual Private Network (VPN) connection or 'tunnel' through the Internet.
Accept incoming connections
Let other computers connect to mine by phone line, the Internet, or direct cable.
Connect directly to another computer
Connect using my serial, parallel, or infrared port.
< Back
Next >
Cancel

Click **Next>**.

The process for completing your Dial-Up Networking connection will vary based on the connection type selected in the previous step.

*If you select **Dial-up to private network** and have only one modem installed:*

a. The **Phone Number to Dial** dialog box is displayed. Enter the phone number of the computer, network or Internet Service Provider (ISP) to which you are connecting. Click **Next>**.

b. The **Connection Availability** dialog box is displayed. If you are creating this connection for multiple users, select **Create this connection for all users**. If this connection will be used only by you, select **Create this connection only for myself**. Click **Next>** to continue.

c. The **Completing the Network Connection Wizard** dialog box is displayed. You are prompted for a name to use for this connection. Enter a meaningful name in the box provided, then click **Finish**.

*If you select **Dial-up to the Internet**, the **Welcome to the Internet Connection Wizard** is displayed as shown below.*

Internet Connection Wizard
Welcome to the Internet Connection Wizard
The Internet Connection wizard helps you connect your computer to the Internet. You can use this wizard to set up a new or existing Internet account.
I want to sign up for a new Internet account. (My telephone line is connected to my modem.)
I want to transfer my existing Internet account to this computer. (My telephone line is connected to my modem.)
I want to set up my Internet connection manually, or I want to connect through a local area network (LAN).
To leave your Internet settings unchanged, click Cancel.
To learn more about the Internet, click Tutorial.
Tutorial
< Back
Next >
Cancel

a. Select the appropriate option for the type of connection you are making to the Internet and click **Next>**. In this example, *"I want to set up my Internet connection manually, or I want to connect through a local area network (LAN)"* has been selected.

b. The **Setting up your Internet connection** dialog box is displayed. Select **I connect through a phone line and modem**. Click **Next>**.

c. If you have only one modem installed, proceed to the next step. If you have more than one modem installed on your computer, select your **Multi-Tech System's** modem from the list and click **Next>**.

d. The **Step 1 of 3: Internet account connection information** dialog box is displayed. Enter the Area code, Telephone number and Country/region name and code for your Internet Service Provider's access number.

e. Click the **Advanced** tab to access options for selecting your connection type and logon procedures. Your ISP should provide this information for your account. If you are not sure which connection type to choose, try PPP.

Although many ISPs automatically provide an IP address for your machine and their Domain Name Server (DNS) each time you connect to them, some ISPs do not. If your ISP provided IP addresses to you, click the **Addresses** tab. In the IP Address section, select **Always use the following:**, and enter the IP addresses into the appropriate boxes. Click **OK** to return to **Step 1 of 3: Internet account connection**, and click **Next>**.

Note: If your machine has a network adapter installed, do **not** enter this address in the address box. Enter the IP address provided by your ISP.

f. The **Step 2 of 3: Internet account logon information** dialog box is displayed. Enter the user name and password you will use for your Internet account. Click **Next>**.

g. The **Step 3 of 3: Configuring your computer** dialog box is displayed. In the box provided, enter a descriptive name for this connection and click **Next >**.

h. You are then asked if you would like to set up an Internet mail account. You may select **Yes** or **No**. If you select yes, you will be asked to provide specific information about your mail service. In this example, **No** is selected. Click **Next>**.

i. The **Completing the Internet Connection Wizard** is displayed. Click **Finish**.

*If you select **Connect to a private network through the Internet**:*

a. In the box provided, enter the Host name or IP address belonging to the computer to which you are calling. Contact the network administrator for the device to which you are connecting to obtain this information. Click **Next>** to continue.

b. The **Connection Availability** dialog box is displayed. If you are creating this connection for multiple users, select **Create this connection for all users**. If this connection will be used only by you, select **Create this connection only for myself**. Click **Next>** to continue.

c. The **Completing the Network Connection Wizard** dialog box is displayed. You are prompted for a name to use for this connection. Enter a meaningful name in the box provided. Click **Finish**.

*If you select **Accept incoming connections**:*

This option allows another computer to create a virtual connection to your computer through the Internet, other public network or a direct cable. Virtual Private connections to your computer through the Internet are possible only if your computer has a known name or IP address on the Internet.

a. The **Devices for Incoming Connections** dialog box is displayed. Select your **Multi-Tech System** modem and click **Next>**.

b. At the **Incoming Virtual Private Connection** dialog box, select either **Allow virtual private connection** or **Do not allow virtual private connection**.

c. The **Allowed Users** dialog box is displayed. Next, you can **Add** or **Delete** users you will allow to connect to this device. Click **Next>**.

d. In the **Networking Components** dialog box, select the boxes next to the name of each networking component you want to enable for incoming connections. Click **Next>**.

e. The **Completing the Network Connection Wizard** dialog box is displayed. In the box provided, enter a meaningful name for this connection and click **Finish**.

*If you select **Connect directly to another computer:***

This connection option is designed to allow a connection between two computers using a serial, parallel or infrared port.

a. The **Host or Guest** dialog box is displayed. Select the role you'd like for *this* computer. Select **Host** if this computer has the information you want to access. Select **Guest** if this computer will be used to access information on the Host computer.

b. If you select **Host**, you will be presented with the **Connection Device** dialog box. Select the device from the list. After installing the device through the Wizard, you may configure the connection properties by right clicking on the icon for this connection and selecting **Properties**. Upon completion, click **Next>**.

The **Allowed Users** dialog box is displayed. Select the check box next to the name of each user you want to allow to connect to this computer. Click **Next>**.

c. If you select **Guest**, the **Select a Device** dialog box is displayed. Select the COM port you'd like to use for this connection from the list. Click **Next>**.

d. The **Connection Availability** dialog box is displayed. If you are creating this connection for multiple users, select **Create this connection for all users**. If this connection will be used only by you, select **Create this connection only for myself**. Click **Next>** to continue.

e. The **Competing the Network Connection Wizard** dialog box is displayed. You are prompted for a name to use for this connection. Enter a meaningful name in the field provided and click **Finish**.

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Valley Cottage, NY 10989

Phone: 800 826-0279

Fax: 914 267-2420

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Internet: http://www.thesupplynet.com

SupplyNet Online Ordering Instructions

1. Browse to http://www.thesupplynet.com. In the **Browse by Manufacturer** drop-down list, select **Multi-Tech** and click

2. To order, type in quantity, and click

3. Click

to change your order

4. After you have selected all of your items click

to finalize the order. The SupplyNet site uses Verisign's Secure Socket Layer (SSL) technology to ensure your complete shopping security.

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